Upper Upper Miocene Fan 2 (UM3 F2) Play

Cristellaria "K" through *Robulus* "E" biozones

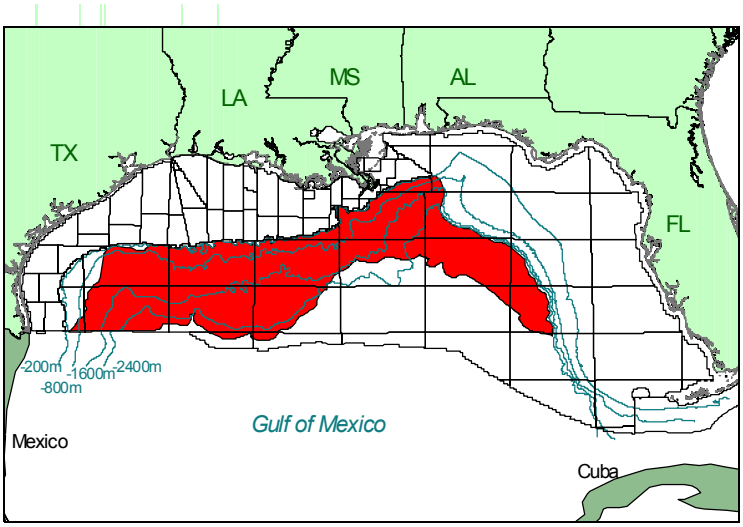

Figure 1. Play location.

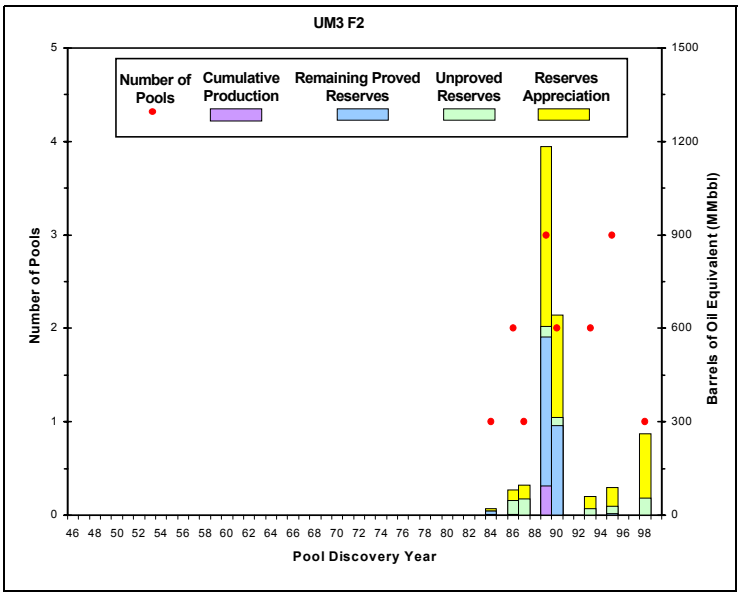

Figure 2. Exploration history graph showing reserves addition and number of pool discoveries by year.

UM3 F2 Play 15 Pools 49 Sands	Minimum	Mean	Maximum
Water depth (feet)	851	3679	6845
Subsea depth (feet)	7709	12591	17179
Number of sands per pool	1	3	10
Porosity	22%	30%	36%
Water saturation	16%	30%	50%

Table 1. Pool attributes. Values are volume-weighted averages of individual reservoir attributes.

Play Description

The established Upper Upper Miocene Fan 2 (UM3 F2) play occurs within the *Cristellaria* "K," *Bigenerina* "A," and *Robulus* "E" biozones. The play is also defined by deep-sea fan sediments in a structural regime of allochthonous salt sheets and canopies with intervening salt-withdrawal basins located on the modern Gulf of Mexico slope. The play extends from the southern Port Isabel, East Breaks, and Alaminos Areas to the southwestern Destin Dome and western Desoto Canyon Areas east of the present-day Mississippi River Delta, and southeast to The Elbow and Vernon Areas offshore Florida (figure 1).

Updip, the play is bounded by the Upper Upper Miocene Fan 1 (UM3 F1) play. To the east, the play onlaps the Cretaceous carbonate slope. Downdip, the UM3 F2 play is limited by the farther downdip occurrence of either (1) the Sigsbee Salt Canopy Escarpment, where the farthest extent of large salt bodies overrides the abyssal plain, or (2) the downdip limit of the Perdido Fold Belt and Mississippi Fan Fold Belt Plays. Downdip in the eastern Gulf of Mexico Region, the play is limited by the southern extent of Louann Salt deposition, as defined by the downdip extent of the Upper Cretaceous to Upper Jurassic Salt Roller/High-Relief Salt Structure (UK5-UJ4 S1) play.

Play Characteristics

Component depositional facies of the UM3 F2 play include channel/levee complexes, sheet-sand lobes, interlobes, lobe fringes, and slumps deposited on the Upper Upper Miocene upper and lower slopes, in topographically low areas between salt structure highs and on the abyssal plain. These deep-sea fan systems are often overlain by

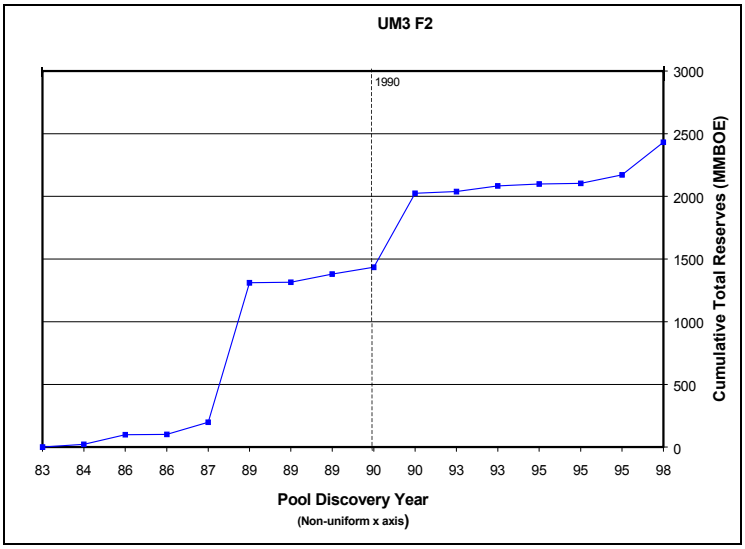

Figure 3. Plot of pools showing cumulative reserves by discovery order. Note the non-uniform x axis.

UM3 F2 Play Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	6	0.692	1.052	0.880
Cumulative production	--	0.081	0.091	0.097
Remaining proved	--	0.612	0.961	0.783
Unproved	9	0.152	0.599	0.258
Appreciation (P & U)	--	0.957	1.894	1.294
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.777	6.630	2.034
Mean	70	1.041	7.660	2.404
5th percentile	--	1.364	8.811	2.847
Total Endowment				
95th percentile	--	2.578	10.176	4.466
Mean	85	2.842	11.206	4.836
5th percentile	--	3.165	12.357	5.279

Table 2. Assessment results for reserves, undiscovered conventionally recoverable resources, and total endowment.

thick shale intervals representative of zones of sand bypass on the shelf, or sand-poor zones on the slope.

The majority of the fields in the UM3 F2 play are structurally associated with salt bodies with hydrocarbons trapped on salt flanks or in sediments draped over salt. Some fields contain hydrocarbon accumulations trapped by permeability barriers, updip pinchouts, or facies changes. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapirism) or stratigraphically (e.g., lateral shale-outs, overlying shales).

Discoveries

The UM3 F2 is predominately an oil play containing total reserves of 1.801 Bbo and 3.546 Tcfg (2.432 BBOE), of which 0.081 Bbo and 0.091 Tcfg (0.097 BBOE) have been produced. The play contains 49 producible sands in 15 pools, of which 6 contain proved reserves (table 1; refer to the Methodology section for a discussion of reservoirs, pools, and sands). The first reserves in the play were discovered in 1984 in the Viosca Knoll 783 field (Tahoe) (figure 2). Maximum yearly total reserves of 1,183 MMBOE were added in 1989 when three pools were discovered, including the largest pool in the play in the Mississippi Canyon 807 field (Mars) with 1,113 MMBOE in total reserves (figures 2 and 3). All of the play's cumulative production and 57 percent of the play's total reserves have come from pools discovered before 1990. The most recent discovery, prior to this study's cutoff date of January 1, 1999, was in 1998.

The15 discovered pools contain 53 reservoirs, of which 15 are nonassociated gas, 36 are undersaturated oil, and 2 are saturated oil. Cumulative production has consisted of 83 percent oil and 17 percent gas.

Assessment Results

The marginal probability of

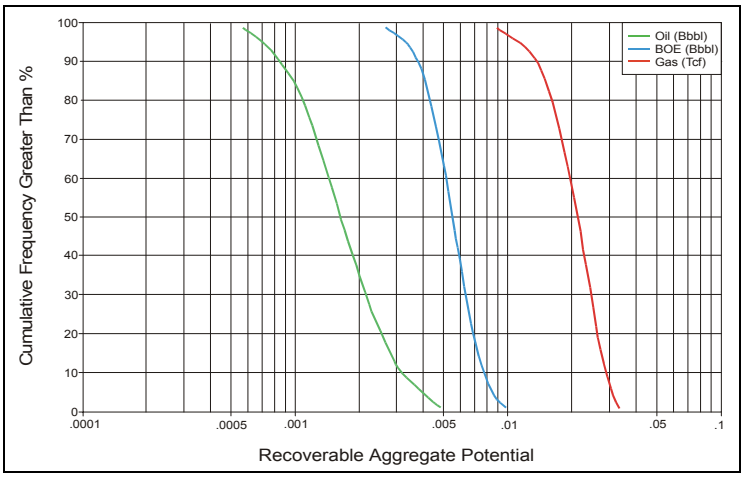

Figure 4. Cumulative probability distribution for undiscovered conventionally recoverable resources.

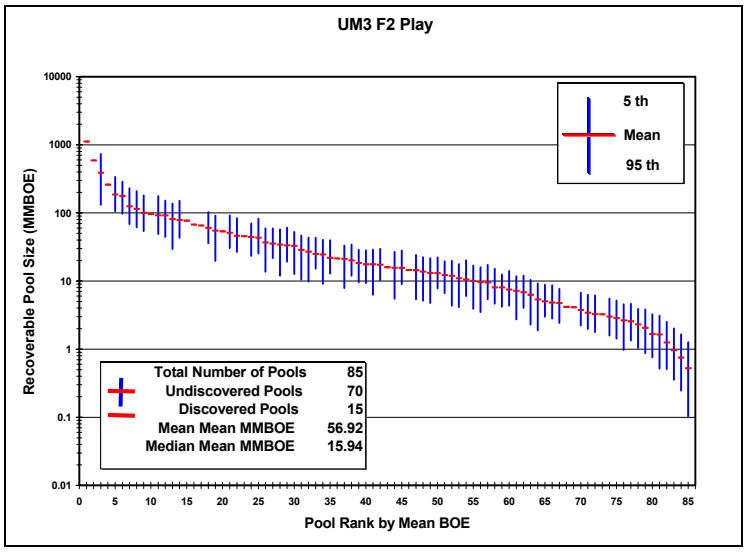

Figure 5. Pool rank plot showing the number of discovered pools (red lines) and the number of pools forecast as remaining to be discovered (blue bars).

hydrocarbons for the UM3 F2 play is 1.00. The play has a mean total endowment of 2.842 Bbo and 11.206 Tcfg (4.836 BBOE) (table 2). Only 2 percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered conventionally recoverable resources (UCCR) have a range of 0.777 to 1.364 Bbo and 6.630 to 8.811 Tcfg at the 95th and 5th percentiles, respectively (figure 4). Mean UCRR are estimated at 1.041 Bbo and 7.660 Tcfg (2.404 BBOE). These undiscovered resources might occur in as many as 70 pools. The largest undiscovered pool, with a mean size of 388 MMBOE, is forecast as the third largest pool in the play (figure 5). The forecast places the next four largest undiscovered pools in positions 5, 6, 7, and 8 on the pool rank plot. For all the undiscovered pools in the UM3 F2 play, the mean mean size is 34 MMBOE, which is smaller than the 162 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 57 MMBOE.

BOE mean UCRR contribute 50 percent to the play's BOE mean total endowment. The UM3 F2 play contains large areas covered by allochthonous salt sheets under which several discoveries have already been made. Exploration potential lies below and around these salt sheets, as well as in structural and stratigraphic traps around salt bodies. Six fields with over 100 MMBOE are forecast as remaining to be discovered. Thus far, discoveries have been located mainly in the Mississippi Canyon and Viosca Knoll Areas.